

Alps, but it is rightly held that the man who goes through a course of training among the crags of Cumberland qualifies himself to tackle the giants of the Alps or Caucasus. Beginning with the tors on Dartmoor, the would-be Alpinist can pass by easy stages to such climbs as those of Deep Gill, Mickledoor and Napes Needle, and then complete his course of instruction on the Alps. For convenience of reference, all the headings are arranged in alphabetical order. It is easy, therefore, to turn up information about hills or rocks which afford climbs, and to find the meaning of technical terms and expressions. It would have been an advantage, however, if Mr. Smith had given a list of climbs in the order of difficulty, for beginners would then know exactly where to commence their mountaineering education. The book is illustrated with twenty-three sketches by Mr. Ellis Carr, and five plans. It will doubtless increase the number of climbers, and the many admonitions it contains ought to keep down the mortality from what someone has called the "greasy pole" exercise.

LETTERS TO THE EDITOR.

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Trituberculy and Polybunty.

It is a matter of regret to me that so clear-headed a naturalist as Dr. Forsyth Major should have misunderstood what I thought to be clear intelligible language.

In his letter (NATURE, May 31) Dr. Forsyth Major declares that, in my paper on the Stonesfield mammalia, I stated that he has expressed views in his paper on Squirrels (*P. Z. S.* 1893) the very reverse of those recorded by him in that paper. All that I have said about Dr. Major, whose paper I read after writing mine, is "Dr. Forsyth Major does not favour this view," viz. that all the various forms of lower molars of Ditremaous mammals can be derived from the tubercular-sectorial type. I shall be glad if Dr. Forsyth Major will either state that he does favour this view, or withdraw his charge of misrepresentation.

Again, I think, Dr. Major has misunderstood my words when he proceeds to declare that I have made "some obviously contradictory statements" in my paper on the Stonesfield mammalia, and in my letter to NATURE of May 3. The object of my remarks on the primitive mammalian tooth in my paper, was to show that that part of the "tritubercular theory" (as lately set forth by Profs. Cope and Osborn) which seeks to explain the tubercular-sectorial tooth as having arisen—within the mammalia phylum—from a single cone through a triconodont stage is beset with weaknesses and improbabilities which render it untenable. The view there expressed that the Pro-mammalian molars "were of an indefinite multituberculate pattern," or, in other words (used in my letter), that they were "provided with many cusps not placed in one line," is *not* inconsistent with the admission that the common ancestors of the Marsupials and Placentals—and even (if we accept Prof. Osborn's latest statements) of the so-called "multituberculata"—may have already developed tubercular-sectorial lower molars, and perhaps tritubercular upper molars. Dr. Forsyth Major, whose careful observations deserve great consideration, has argued, in his letter of May 31, very forcibly against this "working hypothesis." I think it only right to say that the views expressed by him are identical with those which have been urged on me privately, and also expressed in lectures, by Prof. Lankester, under whose direction I made my investigation of the Stonesfield jaws.

The theory I support, then, merely comes to this: that many-cusped teeth of indefinite pattern (such as those of Ornithorhynchus?) gave rise to tubercular-sectorial lower and, perhaps, tritubercular upper teeth, some of which in turn gave rise to many-cusped teeth of definite serially tuberculated pattern (Polymastodon, &c.). Prof. Osborn declared that he had evidence of the latter step. The one mistake to which I plead guilty is that of having apparently endorsed in my letter Prof.

Osborn's view on this latter point. In reality I wished to be understood as admitting temporarily—and until further evidence comes to hand—a statement which I was not in a position to combat by the use of my own observations.

Oxford, June 4.

E. S. GOODRICH.

A Review Reviewed.

I AM rather astonished at the criticism of my use of the term mineraliser in my book on the "Economic Geology of the United States," made by a reviewer in a recent number of NATURE. Surely the sanction of the Century, Webster, and Worcester dictionaries, besides several scientific works, should be considered as warranting my use of the term, unless some very serious objection can be urged.

Since I am writing on the subject, I may say what perhaps should have been said in my preface, that the mineralogical part of the book, to which exception is taken by the reviewer, was not intended to teach mineralogy, but to call attention to a new aspect of the subject—the economic. The students for whom the book was mainly written, those at Cornell University, have, when they begin the study of economic geology, already studied determinative mineralogy and blowpipe analysis, and they have also studied rock-forming minerals from the geological standpoint. Here is the third standpoint, and experience in teaching shows that the plan is not superfluous.

Objection is also made to the absence of illustrations. But this is intentional, for I believe the class-room is the place for these. There we can use large illustrations, lantern-slides, and original maps and sections, which are vastly better than textbook diagrams.

I wish also to make an acknowledgment. As the reviewer points out, and as others have done before him, the chapter on mining terms and methods is weak and in places inaccurate. It was a serious error on my part (for which the book has suffered) not to have submitted this chapter, upon which I have only second-hand knowledge, to some specialist for revision. At present the only thing that can be done is to promise the elimination of the objectionable parts in a second edition, if one is called for.

RALPH S. TARR.

Cornell University, Ithaca, N.Y., June 29.

I WILL reply *seriatim* to the various points of Prof. Tarr's letter.

(1) *Term "Mineraliser."*—I still think the word objectionable in the sense used by Prof. Tarr. To most people it probably conveys the idea of something which converts or helps to convert another substance into a mineral. How can sulphur be said to "mineralise" silver by combining with it? Both the elements already exist as minerals in nature; and one might just as well say that the silver mineralised the sulphur.

(2) *Mineralogical part of the book.*—Prof. Tarr states that the object of this part of the book is not to teach mineralogy, but to call the attention of students to the economic side of the question; but this is no excuse for loose and careless writing, instances of which are far too numerous. We read on page 16: "When a metal is combined with silica (SiO_2), a silicate is formed." "Ores considered from the economic standpoint occur in beds or in veins" (p. 17); this would lead the student to infer that no other modes of occurrence are known. Iron pyrite "grades into copper pyrite, but when there is much copper present the colour becomes more golden" (p. 18) "Grade" as a neuter verb does not appear in my edition of Webster, but it probably is intended to mean "gradually passes into." This reading is confirmed on page 22, where we find "copper pyrites, which is in reality a sulphide of iron and copper combined, the proportion varying from an exceedingly cupriferous variety (chalcopyrite) to pure iron pyrites." Limonite is spoken of as "the rust of hematite" (p. 19). Tin ore "is found both as tinstone, in coarse granites or pegmatites, and as stream-tin" (p. 25). Is not stream-tin a form of tinstone, and may not tin ore be found in *fine-grained* granite and in slate?

Judging from the paragraph on page 26, the author is unaware of the existence of any oxidised ore of nickel. The student does not obtain a correct idea of dolomite by being told that it is carbonate of lime "combined chemically with magnesium" (p. 10). I think that these instances, and others might be quoted, justify my remarks.

(3) *Paucity of illustrations.*—If Prof. Tarr had adhered to

his original intention of merely writing lecture-notes for his class, there would have been some force in his excuse; but when he sends forth his work as "a text-book, with the hope that it may find a wider field," he cuts the ground from under his feet. He must recollect that the majority of his readers will never have the opportunity of seeing his lecture diagrams and lantern-slides. If illustrations are out of place in a text-book, why did the author take the trouble to insert twenty-nine? Surely he is not ashamed of his beautiful and instructive frontispiece.

(4) *Mining chapter.*—After Prof. Tarr's candid confession, I will not say another word likely to cause him pain or annoyance; but will merely express the hope that Professors of Economic Geology, while examining mineral deposits, will take the trouble to notice how they are worked, and so render themselves independent of any second-hand aid when writing upon the art of mining.

THE REVIEWER.

Halo of 90° with Parhelia.

ON July 11 the halo of 90°, intersecting a primary halo of the usual size, but intensely brilliant in colouring, was visible at West Newton, Cumberland, for about four hours—9 a.m. to 1 p.m. The sun shone brilliantly all the time. Light strips and wreaths of cirrus and minute mottled cirro-cumulus marked the upper sky. There were several mock suns, not all equally distinct. The halo of 90°, a very unusual phenomenon, was of a pale grey-blue tint, showing no prismatic colours, except in a very slight degree at the point furthest removed from the sun.

This system of halos formed a splendid sight for about four hours, indicating a vast sheet of ice-crystals. I have observed that parhelia sometimes precede heat, as well as stormy weather.

The intensely vivid colouring of the part of the two (almost concentric) halos, where they intersected above the sun, was most striking.

SAMUEL BARBER.

West Newton, Cumberland, July 11.

P.S.—Four dry days followed, the fifth wet.

Rate of the Flight of Birds.

I SHALL be glad if any of your readers can inform me whether the rate of the flight of any birds other than Homing Pigeons has been accurately measured, and what attempts, if any, have been made to employ birds belonging to other families in place of Homing Pigeons.

F. W. HEADLEY.

Haileybury, July 15.

THE UNIVERSITY OF LONDON AND THE REPORT OF THE GRESHAM COMMISSIONERS.

THE University of London is beyond question the Institution most nearly concerned with the recommendations of the Commissioners appointed to consider the draft charter for the proposed Gresham University in London. These proposals, as was pointed out in NATURE in March last (vol. xlix. p. 405), involve the reconstruction of the present University and the formation of a Senate and Convocation having powers differing considerably from those at present possessed by them. Importance would, under any circumstances, attach to the attitude assumed by either body towards the Report, and in the present case it is in no way lessened by the fact that in the charter of 1863 it is ordained that Convocation—that is, those graduates of the University who have attained a certain seniority and paid certain fees—shall have "the power of accepting any new or supplementary charter for the University, or consenting to the surrender of this our charter, or of any new or supplemental charter," the consent of the Senate being also requisite before either acceptance or surrender becomes operative. This power of veto was exercised by Convocation in 1891, when a draft charter proposed by the Senate was rejected by a large majority, and the

way made clear for University and King's Colleges to proceed with their petition for a separate University.

The preparation of a scheme for engrafting teaching on the present examining functions of the University of London did not originate with the Senate. To Convocation belongs the distinction of being the first to advocate this enlargement of the scope of the University, and its proposals were embodied in a scheme as long ago as 1886, while in a later scheme submitted to the Commissioners it indicated in still further detail the lines on which in its opinion a solution of the question might be found. The inability of each body to accept the schemes of the other, the chronic division of opinion between the Senate and Convocation on the Teaching University question, did not augur well for a joint assent to any scheme resulting from the labours of the Commissioners appointed in 1892.

This contingency evidently presented itself to a large majority of the Commissioners, since, with a wisdom which seems likely to be justified by events, they have gone beyond the terms of reference, which contemplated "the establishment under charter of an efficient Teaching University for London," and say that "in view of the failure of previous attempts to settle this question, and of the difficulty and delay which must inevitably attend an alteration of the constitution of the University through the action of the University itself, we are of opinion that, in accordance with the precedents followed in other cases of University reform, the changes which we recommend should be effected not by charter, but by legislative authority, and by the appointment of a Commission with statutory powers to settle, in the first instance, arrangements and regulations in general conformity with the recommendations which we are about to submit to your Majesty."

The latest project for the inevitable extension of University education in London was speedily recognised by many as a well-considered and feasible plan for meeting the requirements of the case. Highly desirable as it was that it should be accepted by, and not forced upon, Convocation, yet at first the outlook was anything but bright. The Annual Committee of Convocation—the body of graduates elected every year "to advise Convocation upon any matter affecting the interests of the University"—undertook the preparation of a report on the scheme of the Commissioners for presentation to Convocation. While this was under discussion an interview took place between it and the Committee of the Senate charged with the consideration of the Commissioners' Report, and it may be inferred that exception was taken to the revocation of the veto and to the mode of procedure proposed by the Commissioners, since the Chancellor (Lord Herschell), in the course of his reply, is reported to have said: "If the proposals of the Commissioners were generally considered to be for the public good, and a reasonable solution of the problem that had been referred to them, it would scarcely rest with this University, either through the Senate or through Convocation, to veto the plan; nor should the remodelling of the constitution of a public body, with a view to its further efficiency, be regarded as a penal abrogation of its charter."

Disregarding this statesmanlike view of the situation, the Annual Committee the same evening adopted a Report wholly adverse to the proposals of the Commissioners, and drew up five resolutions which they recommended Convocation to adopt. Space will only permit reference to the first: "That Convocation protests against the withdrawal without its consent of the charter of the University of London as proposed by the Gresham Commission . . ." and the fourth: "That Convocation therefore, although it would regret the establishment of a second University in London, is of opinion that it would be less disastrous to establish such a University with a